

## PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner  
 US Department of Commerce  
 United States Patent and Trademark  
 Office, PCT  
 2011 South Clark Place Room  
 CP2/5C24  
 Arlington, VA 22202  
 ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 06 November 2000 (06.11.00)	<b>Applicant's or agent's file reference</b> 30990001 WO
<b>International application No.</b> PCT/GB00/00242	
<b>International filing date (day/month/year)</b> 28 January 2000 (28.01.00)	<b>Priority date (day/month/year)</b> 12 February 1999 (12.02.99)
<b>Applicant</b> FROHLICH, David, Mark et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
04 September 2000 (04.09.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

<b>The International Bureau of WIPO</b> 34, chemin des Colombettes 1211 Geneva 20, Switzerland  Facsimile No.: (41-22) 740.14.35	<b>Authorized officer</b>  Olivia TEFY  Telephone No.: (41-22) 338.83.38
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# PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference  
(if desired) (12 characters maximum) 30990001 WO

### Box No. I TITLE OF INVENTION

Digital Camera With Sound Recording

### Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Hewlett-Packard Company  
3000 Hanover Street  
Palo Alto  
CA 94304  
US

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State (that is, country) of nationality:  
US

State (that is, country) of residence:  
US

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

### Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

FROHLICH, David Mark  
17 Briar Wood  
Westbury-on-Trym  
Bristol BS9 3SS  
GB

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below.)

State (that is, country) of nationality:  
GB

State (that is, country) of residence:  
GB

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

### Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent

☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)

LAWRENCE, Richard Anthony  
Hewlett-Packard Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford, Bristol BS34 8QZ  
GB

Telephone No.

(0)117-312-8295

Facsimile No.

(0)117-312-8941

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS	
<i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p> <p>HICKEY, Marianne 40 Maple Road Bristol BS7 8RQ GB</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input checked="" type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality: GB	State (that is, country) of residence: GB
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p>Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</p>	<p>This person is:</p> <p><input type="checkbox"/> applicant only</p> <p><input type="checkbox"/> applicant and inventor</p> <p><input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)</p>
State (that is, country) of nationality:	State (that is, country) of residence:
<p>This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box</p>	
<p><input type="checkbox"/> Further applicants and/or (further) inventors are indicated on another continuation sheet.</p>	

**Box No.V DESIGNATION OF STATES**

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

**Regional Patent**

- ☐ **AP** ARIPO Patent: **GH** Ghana, **GM** Gambia, **KE** Kenya, **LS** Lesotho, **MW** Malawi, **SD** Sudan, **SL** Sierra Leone, **SZ** Swaziland, **TZ** United Republic of Tanzania, **UG** Uganda, **ZW** Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ **EA** Eurasian Patent: **AM** Armenia, **AZ** Azerbaijan, **BY** Belarus, **KG** Kyrgyzstan, **KZ** Kazakhstan, **MD** Republic of Moldova, **RU** Russian Federation, **TJ** Tajikistan, **TM** Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: **AT** Austria, **BE** Belgium, **CH** and **LI** Switzerland and Liechtenstein, **CY** Cyprus, **DE** Germany, **DK** Denmark, **ES** Spain, **FI** Finland, **FR** France, **GB** United Kingdom, **GR** Greece, **IE** Ireland, **IT** Italy, **LU** Luxembourg, **MC** Monaco, **NL** Netherlands, **PT** Portugal, **SE** Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA** OAPI Patent: **BF** Burkina Faso, **BJ** Benin, **CF** Central African Republic, **CG** Congo, **CI** Côte d'Ivoire, **CM** Cameroon, **GA** Gabon, **GN** Guinea, **GW** Guinea-Bissau, **ML** Mali, **MR** Mauritania, **NE** Niger, **SN** Senegal, **TD** Chad, **TG** Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

**National Patent (if other kind of protection or treatment desired, specify on dotted line):**

- |  |  |
|--|--|
| <input type="checkbox"/> <b>AE</b> United Arab Emirates                        | <input type="checkbox"/> <b>LR</b> Liberia                                   |
| <input type="checkbox"/> <b>AL</b> Albania                                     | <input type="checkbox"/> <b>LS</b> Lesotho                                   |
| <input type="checkbox"/> <b>AM</b> Armenia                                     | <input type="checkbox"/> <b>LT</b> Lithuania                                 |
| <input type="checkbox"/> <b>AT</b> Austria                                     | <input type="checkbox"/> <b>LU</b> Luxembourg                                |
| <input type="checkbox"/> <b>AU</b> Australia                                   | <input type="checkbox"/> <b>LV</b> Latvia                                    |
| <input type="checkbox"/> <b>AZ</b> Azerbaijan                                  | <input type="checkbox"/> <b>MA</b> Morocco                                   |
| <input type="checkbox"/> <b>BA</b> Bosnia and Herzegovina                      | <input type="checkbox"/> <b>MD</b> Republic of Moldova                       |
| <input type="checkbox"/> <b>BB</b> Barbados                                    | <input type="checkbox"/> <b>MG</b> Madagascar                                |
| <input type="checkbox"/> <b>BG</b> Bulgaria                                    | <input type="checkbox"/> <b>MK</b> The former Yugoslav Republic of Macedonia |
| <input type="checkbox"/> <b>BR</b> Brazil                                      | <input type="checkbox"/> <b>MN</b> Mongolia                                  |
| <input type="checkbox"/> <b>BY</b> Belarus                                     | <input type="checkbox"/> <b>MW</b> Malawi                                    |
| <input type="checkbox"/> <b>CA</b> Canada                                      | <input type="checkbox"/> <b>MX</b> Mexico                                    |
| <input type="checkbox"/> <b>CH</b> and <b>LI</b> Switzerland and Liechtenstein | <input type="checkbox"/> <b>NO</b> Norway                                    |
| <input type="checkbox"/> <b>CN</b> China                                       | <input type="checkbox"/> <b>NZ</b> New Zealand                               |
| <input type="checkbox"/> <b>CR</b> Costa Rica                                  | <input type="checkbox"/> <b>PL</b> Poland                                    |
| <input type="checkbox"/> <b>CU</b> Cuba  | <input type="checkbox"/> <b>PT</b> Portugal                                  |
| <input type="checkbox"/> <b>CZ</b> Czech Republic                              | <input type="checkbox"/> <b>RO</b> Romania                                   |
| <input type="checkbox"/> <b>DE</b> Germany                                     | <input type="checkbox"/> <b>RU</b> Russian Federation                        |
| <input type="checkbox"/> <b>DK</b> Denmark                                     | <input type="checkbox"/> <b>SD</b> Sudan                                     |
| <input type="checkbox"/> <b>DM</b> Dominica                                    | <input type="checkbox"/> <b>SE</b> Sweden                                    |
| <input type="checkbox"/> <b>EE</b> Estonia                                     | <input type="checkbox"/> <b>SG</b> Singapore                                 |
| <input type="checkbox"/> <b>ES</b> Spain                                       | <input type="checkbox"/> <b>SI</b> Slovenia                                  |
| <input type="checkbox"/> <b>FI</b> Finland                                     | <input type="checkbox"/> <b>SK</b> Slovakia                                  |
| <input type="checkbox"/> <b>GB</b> United Kingdom                              | <input type="checkbox"/> <b>SL</b> Sierra Leone                              |
| <input type="checkbox"/> <b>GD</b> Grenada                                     | <input type="checkbox"/> <b>TJ</b> Tajikistan                                |
| <input type="checkbox"/> <b>GE</b> Georgia                                     | <input type="checkbox"/> <b>TM</b> Turkmenistan                              |
| <input type="checkbox"/> <b>GH</b> Ghana                                       | <input type="checkbox"/> <b>TR</b> Turkey                                    |
| <input type="checkbox"/> <b>GM</b> Gambia                                      | <input type="checkbox"/> <b>TT</b> Trinidad and Tobago                       |
| <input type="checkbox"/> <b>HR</b> Croatia                                     | <input type="checkbox"/> <b>TZ</b> United Republic of Tanzania               |
| <input type="checkbox"/> <b>HU</b> Hungary                                     | <input type="checkbox"/> <b>UA</b> Ukraine                                   |
| <input type="checkbox"/> <b>ID</b> Indonesia                                   | <input type="checkbox"/> <b>UG</b> Uganda                                    |
| <input type="checkbox"/> <b>IL</b> Israel                                      | <input checked="" type="checkbox"/> <b>US</b> United States of America       |
| <input type="checkbox"/> <b>IN</b> India                                       | <input type="checkbox"/> <b>UZ</b> Uzbekistan                                |
| <input type="checkbox"/> <b>IS</b> Iceland                                     | <input type="checkbox"/> <b>VN</b> Viet Nam                                  |
| <input checked="" type="checkbox"/> <b>JP</b> Japan                            | <input type="checkbox"/> <b>YU</b> Yugoslavia                                |
| <input type="checkbox"/> <b>KE</b> Kenya                                       | <input type="checkbox"/> <b>ZA</b> South Africa                              |
| <input type="checkbox"/> <b>KG</b> Kyrgyzstan                                  | <input type="checkbox"/> <b>ZW</b> Zimbabwe                                  |
| <input type="checkbox"/> <b>KP</b> Democratic People's Republic of Korea       |  |
| <input type="checkbox"/> <b>KR</b> Republic of Korea                           |  |
| <input type="checkbox"/> <b>KZ</b> Kazakhstan                                  |  |
| <input type="checkbox"/> <b>LC</b> Saint Lucia                                 |  |
| <input type="checkbox"/> <b>LK</b> Sri Lanka                                   |  |

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM				
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application*: regional Office	international application: receiving Office
item (1) (12.02.99) 12 February 1999	99301045.3		EP	
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

## Box No. VII INTERNATIONAL SEARCHING AUTHORITY

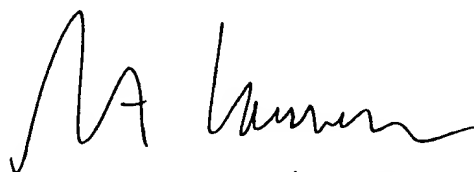
<b>Choice of International Searching Authority (ISA)</b> (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / EP	<b>Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):</b> Date (day/month/year)      Number      Country (or regional Office) 12 February 1999      99301045.3      EP
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## Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets: request : 4 description (excluding sequence listing part) : 15 claims : 4 abstract : 1 drawings : 5 sequence listing part of description : Total number of sheets : 39	This international application is accompanied by the item(s) marked below: 1. <input checked="" type="checkbox"/> fee calculation sheet 2. <input checked="" type="checkbox"/> separate signed power of attorney 3. <input checked="" type="checkbox"/> copy of general power of attorney, reference number, if any: 4. <input type="checkbox"/> statement explaining lack of signature 5. <input checked="" type="checkbox"/> priority document(s) identified in Box No. VI as item(s): 6. <input type="checkbox"/> translation of international application into (language): 7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input checked="" type="checkbox"/> other (specify): EP Search Report
Figure of the drawings which should accompany the abstract: 2b	Language of filing of the international application: English

## Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



Richard Anthony Lawrence

For receiving Office use only		For International Bureau use only	
1. Date of actual receipt of the purported international application:		2. Drawings:	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		<input type="checkbox"/> received:	
4. Date of timely receipt of the required corrections under PCT Article 11(2):		<input type="checkbox"/> not received:	
5. International Searching Authority (if two or more are competent): ISA /		6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

Date of receipt of the record copy by the International Bureau:

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ EP

# PCT

## CHAPTER II

### DEMAND

under Article 31 of the Patent Cooperation Treaty:

The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA		Date of receipt of DEMAND
<b>Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION</b>		Applicant's or agent's file reference 30990001 WO
International application No. PCT/GB00/00242	International filing date (day/month/year) 28 January 2000 (28/01/00)	(Earliest) Priority date (day/month/year) 12 February 1999 (12/02/99)
Title of invention Digital Camera With Sound Recording		
<b>Box No. II APPLICANT(S)</b>		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) Hewlett-Packard Company 3000 Hanover Street Palo Alto CA 94304 US		Telephone No.:  Facsimile No.:  Teleprinter No.: 
State (that is, country) of nationality: US	State (that is, country) of residence: US	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) FROHLICH, David Mark 17 Briar Wood Westbury-on-Trym Bristol BS9 3SS GB		
State (that is, country) of nationality: GB	State (that is, country) of residence: GB	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.) HICKEY, Marianne 40 Maple Road Bristol BS7 8RQ GB		
State (that is, country) of nationality: GB	State (that is, country) of residence: GB	
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.		

**Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE**The following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*LAWRENCE, Richard Anthony  
Hewlett-Packard Limited  
Intellectual Property Section  
Filton Road  
Stoke Gifford  
Bristol BS34 8QZ  
GB

Telephone No.:

(0)117-312-8295

Facsimile No.:

(0)117-312-8941

Teleprinter No.:

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.**Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION****Statement concerning amendments:\***

1. The applicant wishes the international preliminary examination to start on the basis of:

☒ the international application as originally filedthe description ☐ as originally filed  
☐ as amended under Article 34the claims ☐ as originally filed  
☐ as amended under Article 19 (together with any accompanying statement)  
☐ as amended under Article 34the drawings ☐ as originally filed  
☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

\* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: English☒ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes not to elect:

**Box No. VI CHECKLIST**

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- |  |   |        |
|--|---|--------|
| 1. translation of international application                              | : | sheets |
| 2. amendments under Article 34   | : | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | sheets |
| 4. copy (or, where required, translation) of statement under Article 19  | : | sheets |
| 5. letter  | : | sheets |
| 6. other ( <i>specify</i> )  | : | sheets |

For International Preliminary Examining Authority use only

received                      not received

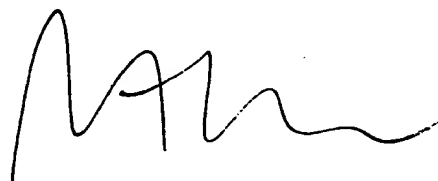
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

The demand is also accompanied by the item(s) marked below:

- |  |   |
|--|---|
| 1. <input checked="" type="checkbox"/> fee calculation sheet                             | 4. <input type="checkbox"/> statement explaining lack of signature                                  |
| 2. <input type="checkbox"/> separate signed power of attorney                            | 5. <input type="checkbox"/> nucleotide and or amino acid sequence listing in computer readable form |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other ( <i>specify</i> ):   |

**Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

*Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).*



Richard Anthony Lawrence

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:

2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):

- |  |   |
|--|---|
| 3. <input type="checkbox"/> The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply.                        | <input type="checkbox"/> The applicant has been informed accordingly. |
| 4. <input type="checkbox"/> The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.                               |   |
| 5. <input type="checkbox"/> Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82. |   |

For International Bureau use only

Demand received from IPEA on:



## PATENT COOPERATION TREATY

## PCT

REC'D 24 NOV 2000

WIPO

PCT

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 30990001 WO	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB00/00242	International filing date (day/month/year) 28/01/2000	Priority date (day/month/year) 12/02/1999
International Patent Classification (IPC) or national classification and IPC H04N1/21		
Applicant HEWLETT-PACKARD COMPANY et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 5 sheets, including this cover sheet.

- ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand  04/09/2000	Date of completion of this report  22.11.2000
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# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00242

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:

### Description, pages:

1-15 as originally filed

### Claims, No.:

1-24 as originally filed

### Drawings, sheets:

1/5-5/5 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/00242

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

### 1. Statement

Novelty (N)	Yes: Claims 1-24
	No: Claims
Inventive step (IS)	Yes: Claims 1-24
	No: Claims
Industrial applicability (IA)	Yes: Claims 1-24
	No: Claims

2. Citations and explanations  
**see separate sheet**

## VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:  
**see separate sheet**

### **Concerning Box V**

The subject-matter of claims 1 to 24 meets the requirements set out in Articles 33 (2) to (4) PCT with respect to the documents cited in the International Search Report, for the reasons set out below.

**EP-A-0 542 377** Discloses the possibility of defining playback sequences for CD-ROM-XA type discs. These sequences may include linked lists comprising any combination of one or more audio segments and one or more (still) images. How the images and audio segments were captured is not disclosed.

**WO-A-98/12868** Is the closest prior art. It discloses a digital camera with sound recording capability for ambient sound or for annotation sound. It is disclosed that one image and one audio clip are stored in a linked group (see data structure 470 defined in Figure 9 and utilised in Figure 10). It is also suggested that the image may be a plurality of images such as time lapse, burst or movie images. However, this means that there is one audio clip and several images in a linked group (470). The other possibilities disclosed in the present application, viz. one image and multiple audio clips, or multiple images and multiple audio clips in one linked group are not functionalities which are hinted at in this document, nor is the desirability of such functionality hinted at. In fact, the bulk of the disclosure relates to the provision of thumbnail images in the data structure (470) to speed up index image display in edit mode.

Note that the skilled person would not consider combining the above documents, in particular as the EP document does not even hint at the use of a digital camera (with sound capability).

**US-A-4 924 303** Discloses an interactive audio clip and video frame retrieval system. The audio and video data are distributed in the VBI of a TV signal, and may be "captured" and stored by a subscriber. There is no suggestion of the use of a digital camera (with sound capability).

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/GB00/00242

**Concerning Box VII**

It is to be noted that although none of the prior art documents discloses or suggests a user interface program as claimed in present claim 24, certain jurisdictions may not allow the patenting of programs as such, or may at least require a different form of claim from the present one.

The claims are not in the two-part form set out in Rule 6.3 (b) PCT. In the regional or national phases, the independent claims could be delimited against the disclosure of WO-A-98/12868, and this document could be acknowledged in the introductory part of the description (Rule 5.1 (a) (ii) PCT).

Reference signs defined in Rule 6.2 (b) PCT are absent from the claims.

The "inclusion by reference" on page 6 may not be allowed in certain jurisdictions. (See Preliminary Examination Guidelines, PG-II, 4.17 and 4.18).

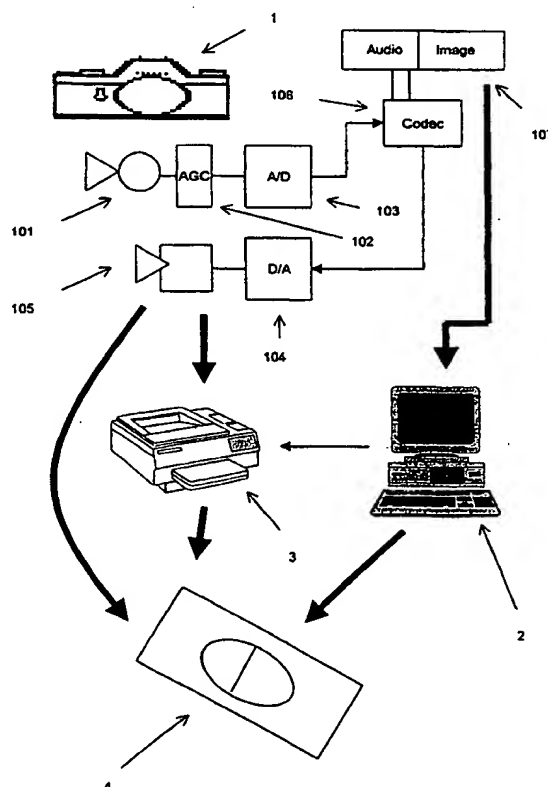
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> : <b>H04N 1/21</b>	<b>A1</b>	(11) International Publication Number: <b>WO 00/48388</b> (43) International Publication Date: 17 August 2000 (17.08.00)
<p>(21) International Application Number: PCT/GB00/00242</p> <p>(22) International Filing Date: 28 January 2000 (28.01.00)</p> <p>(30) Priority Data: 99301045.3 12 February 1999 (12.02.99) EP</p> <p>(71) Applicant (for all designated States except US): HEWLETT-PACKARD COMPANY [US/US]; 3000 Hanover Street, Palo Alto, CA 94304 (US).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): FROHLICH, David, Mark [GB/GB]; 17 Briar Wood, Westbury-on-Trym, Bristol BS9 3SS (GB). HICKEY, Marianne [GB/GB]; 40 Maple Road, Bristol BS7 8RQ (GB).</p> <p>(74) Agent: LAWRENCE, Richard, Anthony; Hewlett-Packard Limited, Intellectual Property Section, Filton Road, Stoke Gifford, Bristol BS34 8QZ (GB).</p>		<p>(81) Designated States: JP, US, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).</p> <p><b>Published</b> With international search report.</p>

(54) Title: DIGITAL CAMERA WITH SOUND RECORDING

## (57) Abstract

A digital camera (1) for capturing sound passages as well as still images has the following elements. It has a camera apparatus (21) for capturing still images. It also has a sound recording apparatus (101, 102, 103, 106) for capturing sound passages. A memory (107) is used for retaining still images as still image files and sound passages as sound passage files. The user interface of the camera is adapted for selectively linking one or more still image files with one or more sound passage files to form a linked group, and for selectively unlinking one or more files from a linked group. This equivalent treatment of still images and sound passages allows effective use of the camera for recording ambient sound together with images, and for flexible construction of sound/image composites representing a user's experience in a rich and effective manner.



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## DIGITAL CAMERA WITH SOUND RECORDING

The present invention relates to a digital camera adapted to allow recording of sound as well as still images. In particular, the invention relates to a digital camera arrangement designed to support the construction of different combinations of sound and images.

It is known that the combination of a still image and sound is a valuable one for the user, not only where the sound is provided as annotation, but also where the sound is ambient at the time of recording the still image. Examples of systems adapted for recording both still images and sound together are disclosed in US Patents Nos. 3439598, 4270853, 4270854, 4905029 and 5276472. A system for display and playback of composite sound and still image is set out in European Patent Application Publication No. 0827018. This combination of sound and still image is also obtainable from certain digital video cameras which have capacity to capture still images - an example is the Hitachi MP-EG1A.

A camera operating system which supports augmentation of still images with sound is Digita, provided by Flashpoint Technology, Inc. Digita provides a menu-driven interface, and also scripts which allow construction of composite items at the camera (such as a page written in HTML with camera-captured image inserts).

In existing products, the sound capture is generally optimised for annotation, rather than for recording of ambient sound. Accordingly, the microphone is directed towards the user rather than to the imaged scene, the sound is recorded after the image is captured, and the combination of media is limited to one sound clip per image. Although capture of ambient sound is a known use of cameras with sound capture features, existing arrangements still provide a simple relationship of association between a single still image and a single piece of sound.

It is desirable to improve the capture of sound together with still images to allow a rich combination of the two which will provide particular benefits to the user.



Summary of Invention

Accordingly, the invention provides a digital camera comprising: camera apparatus for capturing still images; sound recording apparatus for capturing sound passages; a memory for retaining still images as still image files and sound passages as sound passage files; and a user interface adapted for selectively linking one or more still image files with one or more sound passage files to form a linked group, and for selectively unlinking one or more files from a linked group.

Still image files and sound passage files may be files of different types, in which case selective linking between files may be recorded in an index file containing all linkage information. Alternatively, linked groups may have a specific multimedia filetype supporting still image files, sound passage files, and links therebetween: in this case, still images and sound passages may also themselves be provided in this filetype, as it possesses the inherent capacity to be either a still image file, a sound passage file, or both.

By treating the images and sound as equivalent forms of data in this way, rather than merely considering a sound passage as an optional addition to a still image, richer possibilities for creation and editing of associated sound and image data become available. This equivalence makes selection of sound and image to be matched together straightforward. Advantageously, it also allows for creation of more complex objects, with a linked group containing any of one still image file with one or more sound passage files; one sound passage file with one or more still image files; or even a plurality of both sound passage files and still image files. This flexibility is particularly important where ambient sound is to be captured: for example, a desirable approach may be to record the sound, and during recording of the sound to capture a large number of still images, deciding at a later point which images to keep. With a system in which sound is provided through annotation of a single image, this desirable mode of operating is simply not possible.

Advantageously, the user interface is adapted such that a user can select a first and second view of the image files, wherein in the first view a plurality of sound passage files, still image files or linked groups are displayed in an index format for browsing,

and wherein in the second view a single sound passage file, still image file or linked group is displayed for review and editing (including modification of any link). It is helpful if in this second view an additional sound passage file, still image file or linked group is also displayable, and the user interface is adapted to allow linkage between the displayed files to form a new linked group. Another desirable feature is for the sound passage files and still image files of a linked group to be viewable, selectively, either as part of the linked group or independently of the linked group. Another useful feature is for the user interface is adapted so that the sound passage files, the still image files, and the linked objects are all presentable to the user as a separate sequence, and that the user may select between these separate sequences for browsing. This collection of features allows effective browsing through a collection of captured data, and effective combination and review of the data collected.

It is particularly useful, especially in the case of more complex linked groups, for the digital camera to be adapted such that a still image file may be associated with a particular point of time or period of time in the sound passage of a sound passage file. This is valuable if images and sound passages can be captured contemporaneously. In connection with this, it is desirable for there to be a means to mark a captured still image or a captured sound passage with the time of recording. This time stamping can either be absolute, or in the case of contemporaneous recording, relative (that is, an image is stamped with its time of recording relative to the start of the sound passage). Contemporaneous recordings of sound and still images may be provided automatically as linked groups. This structure allows valuable forms of image association to be created, such as an assemblage of still images appearing in a determined succession and spacing against a common passage of ambient sound.

In a development of this approach, embodiments of a camera may include a further data recording device for recording of another data type, and wherein the memory device is adapted to record the other data type as a further data type file, and wherein the user interface is adapted for selectively linking one or more further data type files into a linked group, and for selectively unlinking one or more further data type files from a linked group. These further data types may be graphic annotation (for example, handwriting input) or video clips.

### Description of Figures and Specific Embodiment

Specific embodiments of the invention are described below, by way of example, with reference to the accompanying drawings, in which:

5

Figure 1 shows a system for the capture and reproduction of sound and still images according to an arrangement proposed by the present applicant;

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Figures 2a, 2b and 2c show front (image and sound capture) side, rear (user interface side) and top (capture button) views of a digital camera in accordance with an embodiment of the invention;

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Figures 3a to 3c show the user interface display of Figure 2 in editing mode, and illustrate selection of different data elements;

Figure 4 shows the user interface display of Figure 2 in editing mode, and shows an audiophoto consisting of a sound passage with three attached images;

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Figures 5a to 5c show the user interface display of Figure 2 at three different stages during the playing of the audiophoto of Figure 4;

Figure 6 shows the user interface display of Figure 2 in editing mode showing an index image of captured data; and

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Figures 7a and 7b show the user interface display of Figure 2 in capture mode, and illustrate respectively a viewfinder display and an index display.

30

Basic components in a system for providing an image and related sound are shown in Figure 1. A camera 1 comprises a conventional digital camera mechanism for capturing a still image together with a digital sound recording device for recording a passage of sound. Sound recording means are conventional: a microphone 101, an automatic gain controller 102, an analog/digital converter 103 and a codec 106 - where playback is also available, as in the embodiment to be described below, a

loudspeaker 105 and a digital/analog converter 104 are also be provided. A memory 107 for storage of audio and image information is also required.

It should be noted that although the term "image" is used here, it does not refer merely to a pictorial image. It may also relate to, for example, text captured in an image format. Likewise, when the term "camera" is used, other devices for capturing a still image can be understood to fall within its scope in the context of the present invention.

10 Whereas the process of image and sound capture may be entirely analog, in which case both an analog image recording medium (such as film) and an analog sound recording medium are provided at the camera, in the context of the present invention digital capture of both sound and image is used. Both image and sound are digitized on capture and stored in an appropriate storage medium (for example on a  
15 conventional flash memory or an Iomega "Clik" disk ("Clik" is a trade mark of Iomega Corporation)). In this event, the digital data can be provided to a digital processing means (such as personal computer 2). This is advantageous, as it allows for easy editing of both image and sound data. The image data can then be provided from the digital processing means as a printed image, and the passage of sound  
20 attached thereto in a digital electronic storage medium, such as a flash memory. This is best achieved by means of a printer 3. In printer 3, the image is printed in conventional manner and a sound reproduction device with the passage of sound recorded thereon is attached to the image. Advantageously, recording and attachment of sound is done in the printer itself, but this step may be carried out separately (for  
25 example, at the sound recording device 4, as is described further below). Alternatively, it is possible in some embodiments for the image data and optionally the sound data to be provided directly from the camera to the printer (for example by infra red data transfer using technologies currently known for infra red printing from personal computers - such as under the IrTranP standard): these arrangements may  
30 require the processor in camera 1 to be provided with a printer driver for the appropriate printer.

The result is a tangible representation of the image with an electronic storage medium having the passage of sound recorded thereon attached to it: this is here termed an

"audiophoto". To play the passage of sound, sound reproduction device 4 is employed. This can be connected to the electronic storage medium to enable information stored in the electronic storage device to be transferred to the sound reproduction device, the sound reproduction device 4 containing means to convert the information received from the electronic storage device into the passage of sound. However, sound reproduction device 4 is adapted to be detachable or otherwise remote from the printed image when no connection between the electronic storage device and the sound reproduction device is required.

Further details of these system elements are provided in copending European Patent Application No. 98305436.2, the contents of which are incorporated by reference herein to the extent permissible by law. A digital camera 1 which is an embodiment of the present invention will now be discussed below, with reference to Figures 2a to 2c.

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Figure 2a shows the front (image capture) side of a digital camera 1 according to an embodiment of the present invention. In basic form, digital camera 1 is a conventional handheld camera. This camera is optimised for capture of ambient sound, rather than annotation of images, so in addition to a conventional digital camera apparatus for capturing still images shown here by lens 21, the front side of the camera 1 also has the microphone 101 of a sound recording apparatus (of the kind discussed with reference to Figure 1) for capturing sound passages. In a digital camera optimised for annotation, this microphone 101 would be placed on the rear (user interface) side of the digital camera 1 - alternatively, dual microphones, or means to reorient the microphone for capture from different directions at different times, may be provided. The captured images and sound are eventually stored (in formats and associations discussed below in the context of the user interface of the digital camera) on a memory for retaining still images as still image files and sound passages as sound passage files. This memory comprises a removable flash memory card 107 held in a slot on the side of the camera, and released from the slot by a button release 22.

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Figure 2b shows the rear (user interface) side of the digital camera 1. The display 23 is (preferably) an LCD or other flat screen display. The display can be used either for

image and sound capture (capture mode) or for image and sound editing (editing mode) - both capture mode and editing mode are discussed further below. The display 23 is shown in Figure 2b in editing mode, with an audiophoto image shown with three display elements: image element 231, sound element 232, and selection element 233, all of which will be addressed below in the discussion of editing mode. Switch 26 is used to allow the user to toggle between capture mode and editing mode. Also provided on the user interface side of the digital camera is loudspeaker 102, so that audio playback is directed towards the user.

The user interface controls 24 are provided on the user interface side of the digital camera. The user interface controls 24 are used to browse, organise and edit the captured images and sound, and in particular to allow selective linking of one or more still image files with one or more sound passage files to form a linked group, and for selectively unlinking one or more files from a linked group. The specific functions of different buttons will be described in greater detail in the discussion of the editing mode, but a brief summary is as follows:

data type selection button 241 allows selection of image, sound or both as "active";

deletion button 242 allows deletion of the current active element;

linking/unlinking button 243 allows selected elements to be linked or unlinked;

marking button 244 allows a sound clip to be marked (for reasons discussed further below);

forward button 245 allows a user to step forward throughout data while browsing, or to play a sound passage;

backward button 246 allows a user to step backward throughout data while browsing; and

stop button 247 allows a user to stop playing of a sound passage.

Figure 2c shows a top view of the camera 1. The top of the camera is where data capture controls 25 are located. Data capture controls 25 are essentially conventional: there is an image capture button 251 easily operable with the right hand to record an image, and a dual state sound capture start button 252 easily operable with the left

hand to begin recording of sound on a first button press to end recording of sound on a second button press.

Editing mode will now be discussed with reference to Figures 3 to 6.

5 Figure 3a shows an audiophoto in editing mode. The audiophoto consists of a still image 231 and a sound passage (provided as a graphical representation 232 of the sound). The sound passage is marked with a tag 31 to indicate the association of an image with it - the position of the tag 31 is indicative of the time along the sound  
10 stream represented by the graphical representation 232. The sound passage is also marked with its duration 32. Selection element 233 indicates in Figure 3a that the whole audiophoto is selected. The selection element can be toggled between the states of audiophoto/sound element/image element by pressing the data type selection button 241.

15 When the audiophoto is selected as in Figure 3a, the options provided by the different user interface buttons are as follows. Forward button 245 causes the display to advance to, and play, the next audiophoto. Backward button 246 causes the display to move to, and play, the previous audiophoto. Stop button 247 causes the sound  
20 passage to stop playing. Linking/unlinking button 243 is for linking or unlinking the displayed elements: for an audiophoto, the display at any one time will be showing an image element 231 and a sound element 232 that are linked to each other. Pressing the linking/unlinking button 243 with an audiophoto selected will generally be used to enable the linkage between the image element 231 and the sound element 232 to be  
25 broken: the result could be separated image and sound, separated audiophoto and sound, separated audiophoto and image, or even two separated audiophotos (if both the image and the sound have additional attachments) - it can also be used to modify the link. Both deletion and modification of links are discussed below with reference to Figure 3b. The deletion button 242 in this mode causes deletion of the selected  
30 audiophoto (confirmation by pressing a different designated key would be required in an effective practical interface), and marker button 244 is used to mark the sound passage 232, as is discussed further below with reference to Figure 3b.

If instead the sound passage is selected, as in Figure 3b, then the meaning of the buttons will be different in some cases. The forward button 245 and the backward button 246 now cause display, and play, of the next and previous sound passage respectively. No change is made to the displayed image. Consequently, selection of sound passages only can be used to allow cycling through sound clips to find a clip for attachment to the presently displayed image. Stop button 247 is used to stop playback of a sound clip. Deletion button 242 is used to delete the selected sound passage. Linking/unlinking button 243 is now used essentially for creating or removing links between the selected sound and the currently displayed image. Pressing the button 243 causes a link to be established - or if a link already exists between the sound passage and the image, for that link to be removed. This link may represent a relationship in time between the sound passage and the image: in particular, for which parts of the sound passage the image is to appear. There may be a simple one to one relationship with no element of time (in which case, the image will simply be associated with the beginning of the sound passage), but there may be a sequence of images appearing successively at different times during the sound passage. To support this, the user interface provides means on creation of a link to position that link within the sound passage. When the link is created, it will appear provisionally at the start of the sound passage (unless capture was contemporaneous - see below), and can be moved forward or backward along the sound passage by use of markers, as described below. In a variant of this approach, if capture of images and sound are time stamped (either absolutely, or if contemporaneously captured images and sound are time stamped relative to each other), the initial position of a link between contemporaneously recorded sound and images can be at the actual point of capture of the image within the sound record.

Use of marking within the sound record can be used to improve construction of the relationship between images and sound. While a sound passage is playing, pressing of the marker button 244 places a marker (not shown in Figure 3a or Figure 3b, but visible as a visual symbol in sound record 232) in the sound record at a time corresponding to the point in the sound record at which the marker was pressed. When the sound record is not playing, pressing of the marker button 244 places the sound clip into a state in which the markers can be used for editing. Initially, a passage in the sound record up to the point of the first marker is selected. Pressing



forward button 245 advances selection to the first marker itself, and further pressing forward button 245 advances selection to the passage of sound between the first and second markers. Pressing the button again advances to the second marker, and successive presses alternate between selection of markers and intervening passages until the end of the sound clip is reached, at which point the process starts again from the beginning of the clip. In this way, either a marker itself, or the sound passage between two markers, can be selected. By use of the backward button 246 it is possible to cycle through the markers and intervening passages in the opposite direction. In this way, a marker or intervening passage may be selected and either deleted with delete button 242 (and so edit the sound clip itself) or used to set up a link with an image (by using linking/unlinking button 243), the link thus establishing either when the image will display within the resulting audiophoto (if the link is with a marker) or over what period of time within the resulting audiophoto that the image will display (if the link is with an interval).

The alternative to selecting the audiophoto or selecting the sound passage is to select the image, and this is shown in Figure 3c. The forward button 245 and the backward button 246 now cause display of the next and previous images respectively. No change is made to the displayed sound passage. Consequently, selection of images only can be used to allow cycling through all the images for attachment to the presently displayed sound passage. Deletion button 242 is used to delete the selected image. Linking/unlinking button 243 is now used essentially for linking the selected image with the currently displayed sound, using principles discussed above in relation to Figure 3b.

Although not shown here, practical embodiments will require a confirmation step for significant events, such as deletion of an audiophoto, image or sound clip. Advantageously, an "undelete" function will also be provided to allow deletions to be recovered to whatever extent is practical.

A highly advantageous feature of the embodiment of the present invention is that it supports audiophotos that are more than a simple association of a sound passage with an image: in particular, an audiophoto may comprise a sound passage with one or more images, each of which has a relationship in time with the sound passage, or

alternatively a collection of more than one sound passage with one or more images. An example of an audiophoto with a single sound passage but a plurality of images is shown in Figures 4 and 5. Figure 4 shows the initial view of such an audiophoto, with the audiophoto selected but the sound not playing. There are three images 42, 43, 44 associated with the sound passage represented by trace 41, each of which are represented in the trace 41 by a discrete clip icon 45, 46, 47. The clip icons are located in positions corresponding to the point in the sound passage at which they are intended to appear. The change in the display as the sound passage plays is shown in Figures 5a to 5c.

Clip icon 45 is located at the start of the sound passage, so image 42 is displayed from the beginning of the sound passage. A visual representation for the amount of the sound passage so far played is provided by a background bar 48 behind trace 41. In Figure 5a, it can be seen that the sound passage is part played, but that the second clip icon 46 has not yet been reached. In consequence, the first image 42 is being displayed. When the second clip icon 46 position is reached, then the second image 43 will be displayed. Figure 5b shows display of the second image 43 at a point during playback of the sound passage after the second clip icon 46 has been reached but before the third clip icon 47 has been reached. After the third clip icon 47 has been reached, the third image 44 is displayed. In this case, each of the images is associated with a point in time (indicating the beginning of display of that image) rather than a period of time (as would be the case if the image was linked, through use of markers, with a part of a sound clip). There is no basic difference between the two situations - however, linking with passages of time can be used to provide dark intervals between pictures, or overlaps.

It is desirable for there to be a view of the various available audiophotos and elements which renders it easier to compare different elements, or to move between elements to be edited. Accordingly, the editing mode may also provide an index view for viewing multiple elements, or collections of elements. Such an index view 61 is illustrated in Figure 6. This index view includes all elements that are not part of an existing audiophoto, together with existing audiophotos. A selection frame 62 is provided to allow selection for viewing and playing (as in Figure 3a to 3c) of a particular element or audiophoto - such selection can be achieved through use of forward button 245 and

backward button 246. Delete button 242 is used to delete the elements within selection frame 62. An appropriate button combination is used to switch between single audiophoto view and index view. When in index view, transition to single audiophoto view is achieved by pressing data type selection button 241 while stop  
5 button 247 is being pressed. The reverse transition from single audiophoto view to index view can be achieved by the same button combination. When switching from index view to single audiophoto view, the display 23 will change to contain the element or elements within the selection frame 62 in single audiophoto view.

10 It is possible from the index view to determine whether a particular entry is an image, a sound passage, a simple audiophoto or a more complex audiophoto (not a simple 1:1 relation of image and sound). Images 64 and sound passages 65 are readily identifiable as they contain no sound trace and no image respectively. Simple audiophotos 63 can be seen to contain one sound trace and one image. More complex  
15 arrangements, such as a single image with two sound clips 66 or a single sound clip with multiple images 67, are again clearly identifiable as instead of providing a representation indicative of the start (or any other point) of the sound passage, an icon is provided for every element. For example the image 66 with two sound clips has a single image shown but two sound traces shown: however, the image 67 with a single  
20 sound clip but three images shows all three images in the image view 67, rather than just a single image associated with a particular point in time. The image view is thus an effective way to determine quickly the composition (at least the image composition) of existing audiophotos.

25 Different forms of image view are possible. An alternative could be to show all images, or all sound samples, or all audiophotos, and to toggle between these alternatives with the data type selection button 241. Another alternative would be to provide separate index displays of sound passages and images. Images and sound samples could be displayed according to their time of capture (particularly appropriate  
30 if some form of absolute time stamping is available).

By pressing button 26, the camera is switched between editing mode as discussed above, and capture mode. The initial image in capture mode will be as for a conventional digital camera: a simple image indicating what would be recorded if at

that point image capture button 251 were to be pressed. If the image capture button 251 is pressed at this point, then a simple image results (like images 64 in Figure 6). However, the position changes when recording of a sound passage is initiated by pressing sound capture button 252. This causes the display to appear as shown in Figure 7a, with a sound bar 71 showing the build up of the sound passage (the length of sound so far captured, together with an indication that recording is in progress, are also provided) and a viewfinder image 72 below. If sound recording stop button 253 is pressed before image capture button 251 is pressed, then a pure sound passage will be recorded, like sound passage 65 in Figure 6. However, if image capture button 251 is pressed while sound recording is building up, then a contemporaneous sound and image capture occurs. Advantageously, this links the captured image and the sound passage 71 directly, with the link registered for initial purposes at the point during the sound passage at which the image capture occurred (of course, the time relationship in the link can be changed at a later point through editing).

If an audiophoto is built up in this way, it is desirable for an alternative view to be available to illustrate all the elements of the audiophoto. Accordingly, if the data type selection button 241 is pressed during capture, then the image display is toggled between the viewfinder image 72 shown in Figure 7a to a composite of captured image thumbnails 73, each marked with their time of recording relative to the start of the sound passage. The representation of the sound passage 71 is marked in this view with indicators 74 showing the time of recording for the different images.

In addition to pure capture and pure review, it is desirable and possible to support an intermediate arrangement in which new audio or image data can be inserted selectively into the existing set, rather than simply added to the end.

Insertion of such an additional image or sound segment is here carried out from the review mode, with the appropriate context (audiophoto, sound clip, or image) for the insertion being selected in the single audiophoto view on display 23.

When the insertion context is a sound clip, the user presses image capture button 251 to attach a new photo to the clip, or presses sound capture button 252 twice to capture a new sound passage which is appended to the end of the existing sound clip. If the

user wishes to insert a new sound segment at an appropriate point during the existing sound passage, this can be done by advancing to and marking with marker button 244 the desired insertion point, and in that state capturing the new sound clip.

- 5 When the insertion context is a still image without sound, the user can simply press the image capture button 251 to add a new image after the existing image, or use the sound capture button 252 to record an audio segment which is then attached to the selected image.
- 10 When the insertion context is an existing audiophoto, the user can press the image capture button 251 to attach a new image to the sound clip, creating or extending a series of photos for the same clip. The point in the sound passage at which the new image is introduced can be automatically assigned, or manually positioned by use of the marking button 244 as previously described. Alternatively, the sound capture
- 15 button 252 can be used to record a further sound segment, either to append to the audioclip, or to position within the audioclip by use of the marking button 244 as previously described.

After capture, the following information is stored in the memory 107: images (stored as discrete files), sound passages (stored as discrete files), and timestamping and (where relevant) linking information. There are two possible approaches for this, either of which can be used in satisfactory embodiments. The first is for the image and sound to be stored in their own separate data types, with all linking, timing and selection information stored in a separate index file. This solution is probably the

25 simplest to implement, but is not convenient for selective transfer of information from memory 107 to another device. The second approach is for there to be a multimedia filetype for audiophotos, supporting image, sound, timing and linking information. If such a filetype is used, then this filetype can be used for all information captured (including images alone, and sounds alone) so all files processed by the camera can be

30 of the same filetype. This solution allows each resultant audiophoto to be freestanding as a single file, without reference to an index, rendering selective transfers from memory 107 straightforward. This information can then be transmitted in any of the paths shown in Figure 1: to a personal computer 2 (an effective route for complex audiophotos - which could then be transmitted, for example, by electronic mail),

directly to a printer 3 or to a reader appliance 4. For simple images, sound passages, or audiophotos, sending directly to a printer or reader appliance is essentially as described in copending European Patent Application No. 98305436.2, but differences are required if there are multiple images in an audiophoto. For example, a complex audiophoto sent directly to a printer could be rendered with the visual element shown in a composite form as shown in Figure 6. The reader appliance 4 could also be replaced with a composite reader/viewer appliance (not shown) capable of displaying images and playing back sound to play back an audiophoto as captured or devised at the camera 1: the functions to be provided need only be those offered by the user interface of the camera 1 (possibly retaining the browsing features but not the editing features), though with preferably sufficiently high quality display and sound playback to provide a satisfactory experience to the user.

In addition to still images and sound, it is possible for other data types to be captured at a digital camera. A digital camera can typically be adapted to capture and store short bursts of video without difficulty: such video bursts may be provided in the same manner as sound passages as an augmentation of a still image. Similarly, means to provide a graphic input at the user interface (for example, a pen-based digitiser interface and means for recognising handwriting or a custom alphabet such as Graffiti) may be used to provide graphic input to provide a similar augmentation. Such augmentations may be treated in essentially the same way as sound passages, and may be used as further (or conceivably alternative) elements in a linked group.

As the skilled man will appreciate, many variations upon the features indicated above can be made in devising alternative embodiments of the invention. For example, the structural arrangement of the camera can be changed considerably - display 23 may be used only as a user interface display, with a separate viewfinder being placed elsewhere on the camera, or a different arrangement and type of controls can be employed for the user interface.

CLAIMS

- 5 1. A digital camera comprising:  
camera apparatus for capturing still images;  
sound recording apparatus for capturing sound passages;  
a memory for retaining still images as still image files and sound  
passages as sound passage files; and  
10 a user interface adapted for selectively linking one or more still image  
files with one or more sound passage files to form a linked group, and  
for selectively unlinking one or more files from a linked group.
2. A digital camera as claimed in claim 1, wherein a linked group may consist of  
15 one still image file with one or more sound passage files.
3. A digital camera as claimed in claim 1, wherein a linked group may consist of  
one sound passage file with one or more still image files.
- 20 4. A digital camera as claimed in any of claims 1 to 3, wherein the user interface  
is adapted such that a user can select a first and second view of the image files,  
wherein in the first view a plurality of sound passage files, still image files or  
linked groups are displayed in an index format for review, and wherein in the  
second view an individual sound passage file, still image file or linked group  
25 is displayed for editing.
5. A digital camera as claimed in claim 4, wherein in the second view an  
additional sound passage file, still image file or linked group is also  
displayable, wherein the user interface is adapted to allow linkage between the  
30 displayed files to form a new linked group.
6. A digital camera as claimed in claim 4 or claim 5, wherein in the second view  
a further sound passage or still image may be captured and linked

automatically to the individual sound passage file, still image file, or linked group displayed.

- 5 7. A digital camera as claimed in any preceding claim, wherein the digital camera is adapted such that a still image file may be associated with a particular point of time or period of time in the sound passage of a sound passage file.
- 10 8. A digital camera as claimed in any preceding claim, wherein the digital camera is adapted such that the camera apparatus may capture one or more still images at the same time that the sound recording apparatus is capturing a sound passage.
- 15 9. A digital camera as claimed in claim 8, wherein any still images captured at the same time as a sound passage are provided initially as part of a linked group with the sound passage.
- 20 10. A digital camera as claimed in any preceding claim, further comprising a time recording means to mark a captured still image or a captured sound passage with the time of recording.
- 25 11. A digital camera as claimed in claim 10 where dependent on claim 8, wherein the time recording means is adapted to mark the time of capture of a captured still image relative to a contemporaneously recorded sound passage.
12. A digital camera as claimed in any preceding claim, wherein the user interface is adapted for selective deletion by a user of a still image file, a sound passage file or part of a sound passage file, or a linked group.
- 30 13. A digital camera as claimed in any preceding claim, wherein the user interface is adapted such that sound passage files and still image files of a linked group are viewable, selectively, either as part of the linked group or independently of the linked group.



14. A digital camera as claimed in claim 13, wherein the user interface is adapted so that the sound passage files, the still image files, and the linked objects are all presentable to the user as a separate sequence, and that the user may select between these separate sequences for browsing.

5

15. A digital camera as claimed in any preceding claim, wherein the memory retains linked groups as separate sound passage files, still image files, and one or more index files containing linking information.

10 16. A digital camera as claimed in any preceding claim, wherein the memory retains linked groups as multimedia files, containing sound passage information, still image information, and linking information.

15 17. A digital camera as claimed in claim 16, wherein the sound passage files and the still image files are both multimedia files.

18. A digital camera as claimed in any preceding claim, further comprising a further data recording device for recording of another data type, and wherein the memory device is adapted to record the other data type as a further data type file, and wherein the user interface is adapted for selectively linking one or more further data type files into a linked group, and for selectively unlinking one or more further data type files from a linked group.

20 19. A digital camera as claimed in claim 18, wherein the further data type is handwriting data, and the further data recording device is a device for recording handwriting in a digital representation.

25 20. A digital camera as claimed in claim 18, wherein the further data type is a video clip, and the further data recording device is a device for recording video clips.

30

21. A digital camera as claimed in any preceding claim, wherein the sound recording apparatus and the camera apparatus are arranged for data capture in a substantially common direction.

22. A digital camera as claimed in any preceding claim, wherein the memory is a flash memory device.

5 23. A digital camera as claimed in any preceding claim, wherein the digital camera is adapted to be handheld by a user for still image and sound passage capture.

10 24. A program for operating the user interface of a digital camera comprising camera apparatus for capturing still images and sound recording apparatus for capturing sound passages, wherein the program comprises means for linking one or more still images with one or more sound passages to form a linked group, and means for unlinking one or more elements from a linked group.

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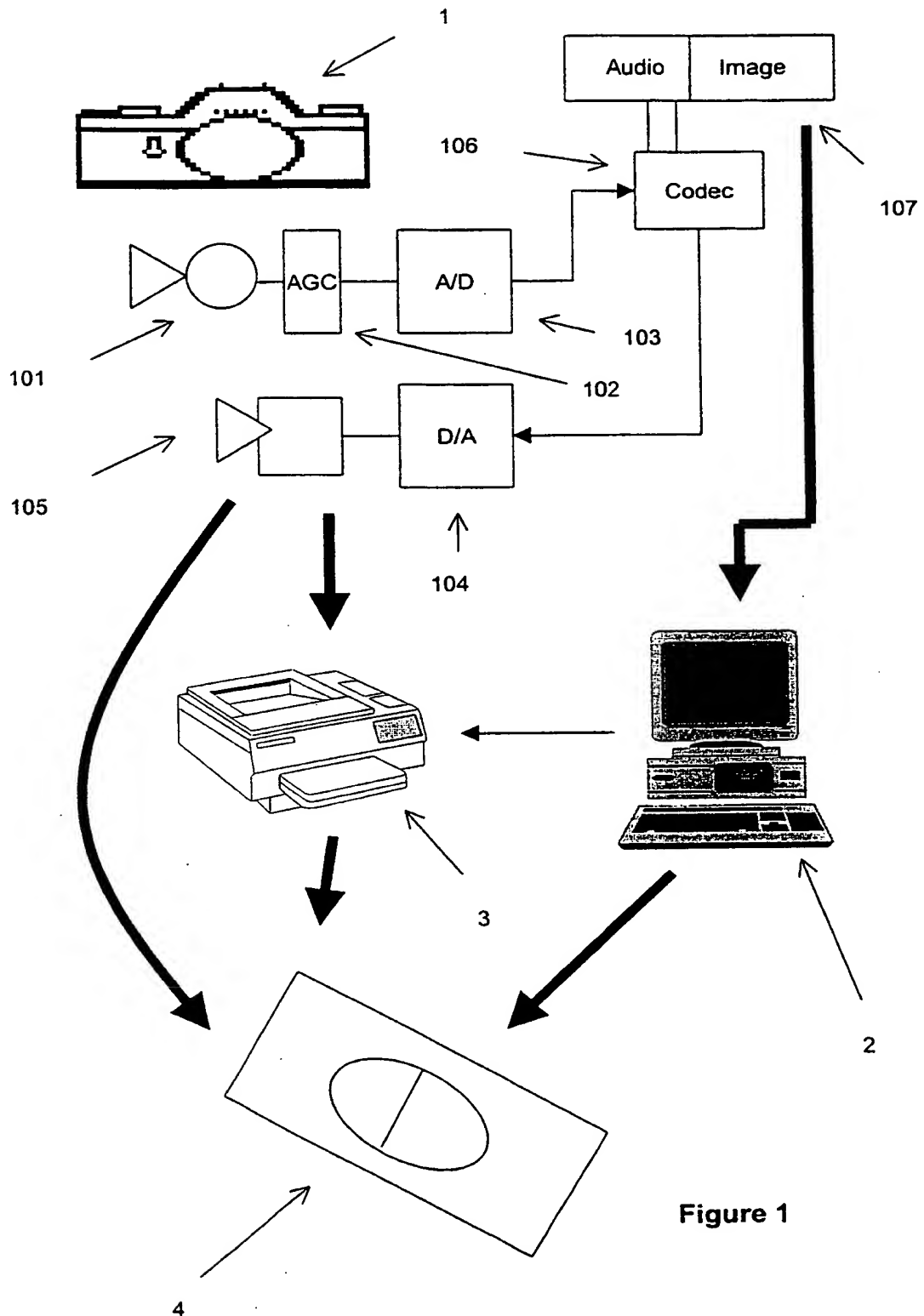


Figure 1

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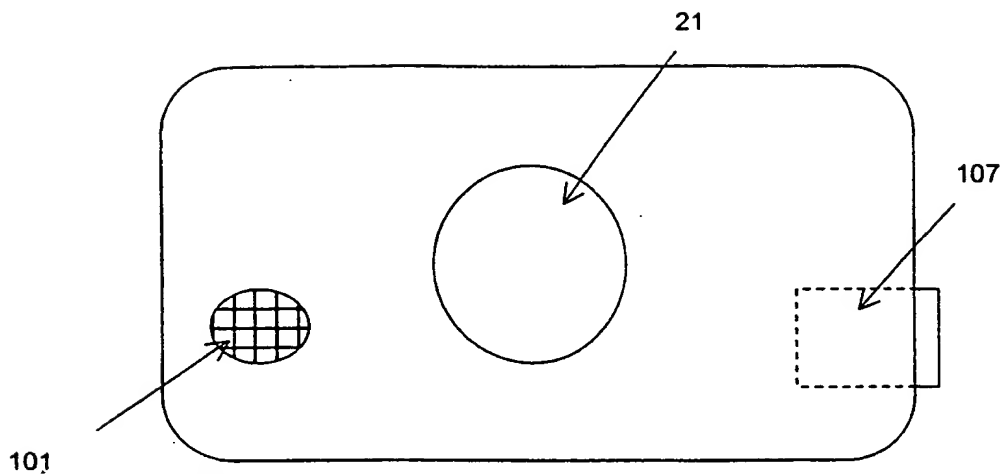


Figure 2a

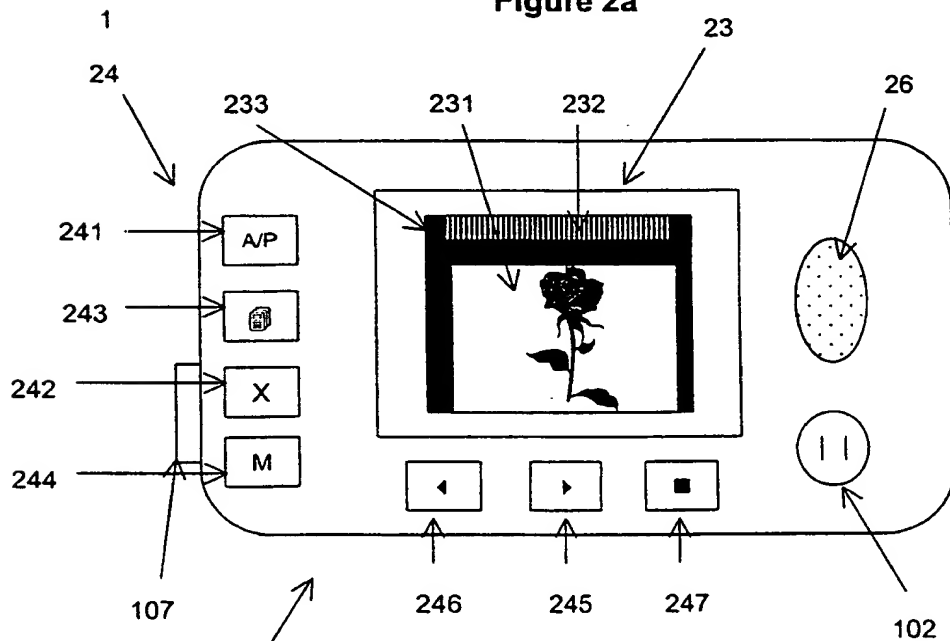


Figure 2b

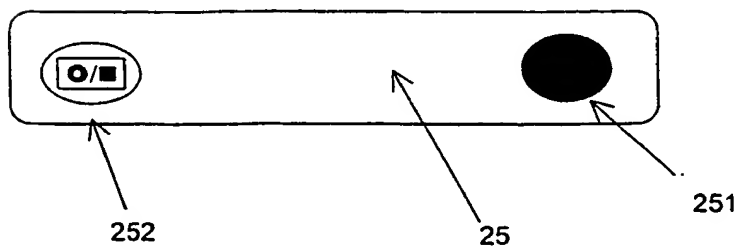


Figure 2c

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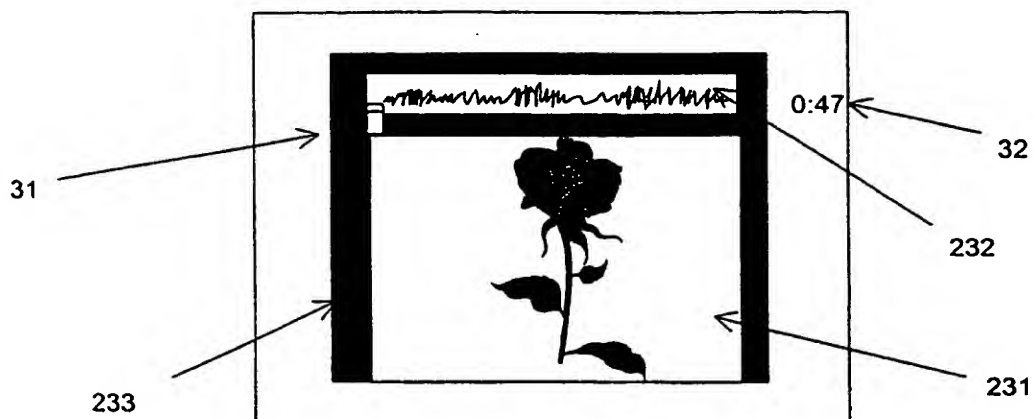


Figure 3a



Figure 3b

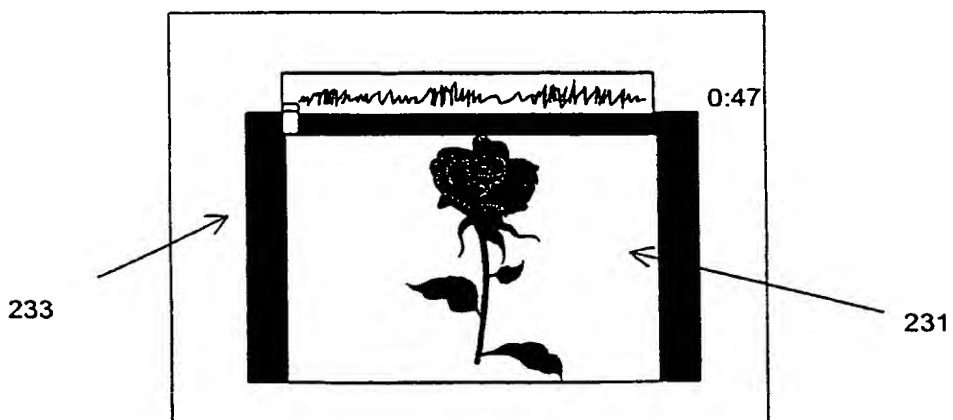


Figure 3c

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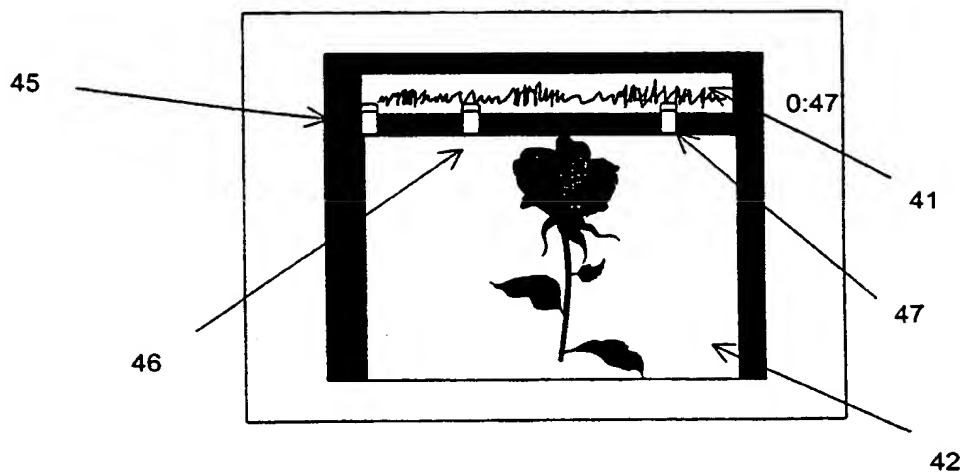


Figure 4

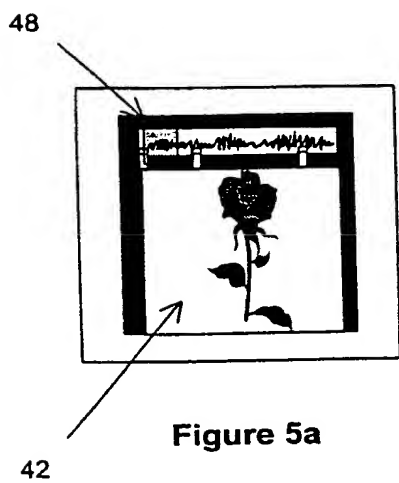


Figure 5a

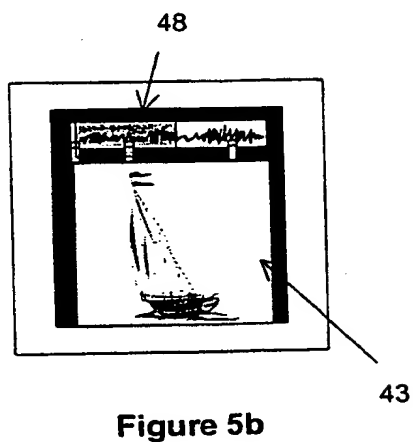


Figure 5b

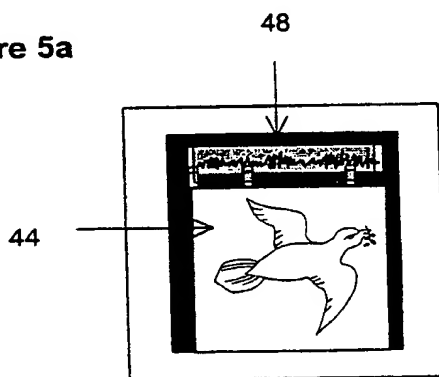


Figure 5c

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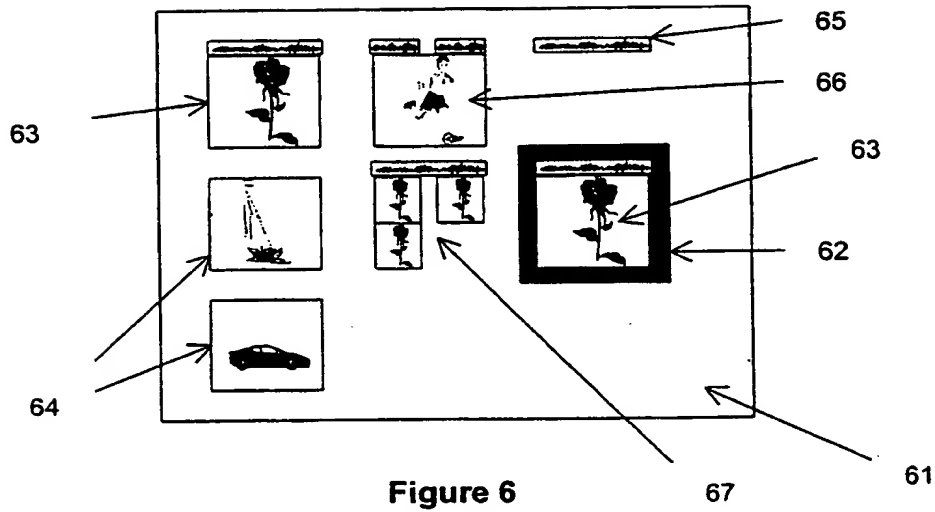


Figure 6

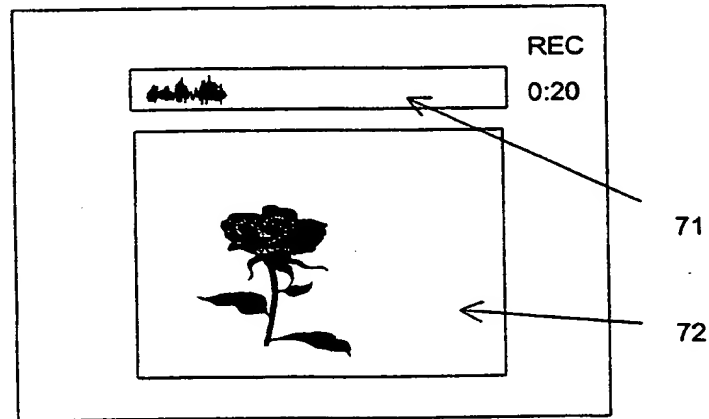


Figure 7a

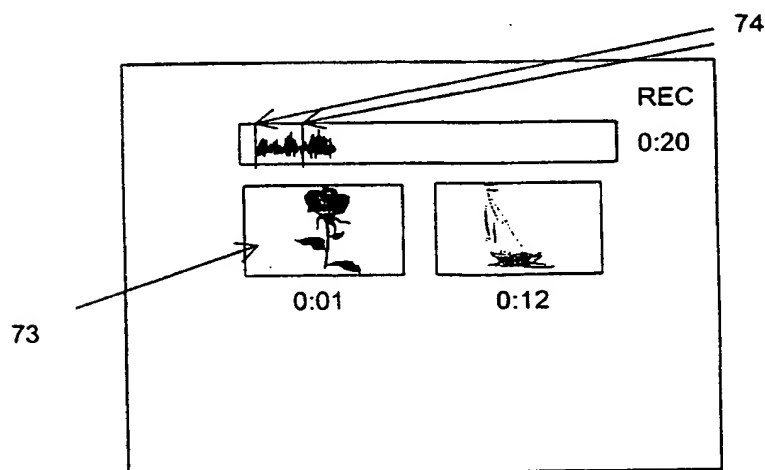


Figure 7b